

THOMAS J. BAERWALD**RIDESHARING IN AMERICAN CITIES**

More than any other nation, the United States has embraced the automobile as the primary form of human transportation. Over 97 percent of all vehicular person trips are made in private automobiles, vans and trucks (1). The image of America as a nation on privately-owned wheels is reinforced by the dramatic shifts that accompanied changes in the transportation system. Proximity to streets and highways became a major criteria that influenced the location of stores, factories, residences, recreational facilities, and other land uses. As a result, people and economic activities dispersed at local, regional, and national scales.

The last decade saw growing concern in the United States about the problems associated with heavy reliance on the automobile. These problems included adverse environmental impacts, especially air and noise pollution, increased congestion on roadways, and reduced accessibility for those persons, particularly the elderly, handicapped, and poor, who were unable to own or operate an automobile. Most dramatically, the petroleum crises of the 1970s, which produced temporary supply shortages and permanent price increases, demonstrated how easily a transportation system dominated by private motor vehicles could be disrupted.

Public transportation was seen by many as a solution to many of these problems, but transit was not viable in most locales. Fixed rail systems, which offered the greatest potential savings because of economies of scale, were very expensive to construct and were ill-suited to serve the low-density metropolises that emerged in the automobile era. Furthermore, operation of all forms of public transit became extremely costly, so that public subsidies were required

(1) Data collected during the 1977 Nationwide Personal Transportation Study by the Highway Statistics Division, Federal Highway Administration, Washington, D.C.

to pay for roughly two-thirds of all transit operating costs in the United States (2).

Because public transit did not emerge as a viable alternative for most travelers, attention focused on making better use of the automobiles that most Americans were so determined to use. Major improvements in fuel efficiency and emission controls alleviated some of the problems, but roadways became more congested and most vehicles continued to be underutilized. About 60 percent of all private vehicle trips were made by a driver carrying no additional passengers, and the average occupancy for all types of travel was roughly 1.7 persons per vehicle trip (3). Ridesharing programs, designed to encourage and facilitate "matching" of travelers who would share the use of an automobile (thereby forming a carpool) or a van (forming a vanpool), have been established in hopes of decreasing those figures, thereby allowing existing vehicles and facilities to be used more efficiently.

The use of average figures for all trip purposes across the United States is deceptive, because wide variation has existed in the degree to which Americans shared rides. The 1977 Nationwide Personal Transportation Study found that average vehicle occupancies for trips in private vehicles ranged from approximately 1.2 persons per vehicle trip for commutes between home and work to 2.1 persons for all forms of social and recreational travel, 2.4 persons for pleasure driving, and 2.8 persons for vacation travel. Occupancies also varied as a function of trip distance, with trips of 3 miles (5 Km) or less averaging 1.2 persons per vehicle for commutes and 1.6 persons for all purposes, while trips of 41 or more miles (66 or more Km) averaged 1.5 persons for commutes and 2.2 persons for all trip purposes (4). The annual housing surveys of the U. S. Bureau of the Census disclosed considerable variation in ridesharing among commuters in different metropolitan areas. Among 21 metropolitan areas surveyed in 1975, for example, the percentage of commuters who carpooled ranged from a low of 14 percent in the San Francisco-Oakland area to a high of 27 percent in the Newport News-Hampton (Virginia) area (5). In the nation as

(2) *Transit Fact Book*, 1981 Edition (Washington, D.C.: American Public Transit Association, 1981).

(3) "Vehicle Occupancy", 1977 *Nationwide Personal Transportation Study*, Report No. 6 (Washington, D.C.: Highway Statistics Division, Federal Highway Administration, 1981).

(4) *Ibid.*

(5) *The Journey to Work in the United States: 1975*, Special Studies P-23, No. 99 (Washington, D.C.: U.S. Bureau of the Census, 1979).

whole, the 1980 Census of Population found that 19.7 percent of all commuters rode in carpools, compared with 64.4 percent who drove alone and 6.4 percent who used public transit (6).

Most ridesharing programs in the United States have focused on commutes between home and work, because these trips are the most numerous, the most regular, and the most concentrated in time and space. "Solo drivers" account for four of every five private vehicle trips taken by commuters, the majority of which are taken during "rush hours", the peak travel periods when roadway congestion is heaviest (7). Because so many empty seats are available during these periods, rideshare promotion has been viewed as a relatively inexpensive way to reduce the volume of traffic on streets and highways. After the 1974-75 energy shortage, the U. S. government spent \$14.4 million to develop rideshare programs in 96 metropolitan areas and saw an average increase of 2.8 percent in the number of commuters who used rideshare arrangements. By contrast, over \$1.5 million was given by the federal government for transit capital and operating assistance in the entire nation during the 1975 fiscal year, but mass transit in the cities where rideshare programs were established carried only 6.9 percent of all commuters (8).

Many local rideshare promotional and matching efforts have had enviable success records. The state of Texas established a statewide vanpool program in 1978 and put over 2,500 vans on the road. Almost 2,000 of these were in the rapidly growing and highly congested Houston metropolitan area, where one large company, Brown and Root, sponsored more than 270 vans (9). Private initiatives also have been successful. The 3M Company, which started the nation's first vanpool program in 1973, has operated as many as 150 vanpools. About 40 percent of the more than 11,000 employees at its suburban St. Paul headquarters rideshare, and 3M officials estimate that the reduced number of private vehicles used by workers saved the company over \$3.5 million in con-

(6) "General Social and Economic Characteristics". *1980 Census of Population*, Report PC80-1-C1 (Washington, D.C.: U.S. Bureau of the Census, 1983).

(7) "Home-to-Work Trips and Travel". *1977 Nationwide Personal Transportation Study*, Report No. 4 (Washington, D.C.: Highway Statistics Division, Federal Highway Administration 1980).

(8) Ray A. Mundy, "The U.S. Ridesharing Experience", paper presented at the annual meeting of the Transportation Research Board, Washington, D.C., 1982.

(9) Donald A. Maxwell, *et al.*, "Vanpooling in Texas: Past, Present, and Future", paper presented at the annual meeting of the Transportation Research Board, Washington.

struction costs for new parking facilities. In other companies, reduced rates of tardiness and absenteeism have been cited as advantages of rideshare programs.

On the negative side, many large rideshare promotional programs have had disappointingly small placement rates. Rideshare programs in the Los Angeles, Denver, and Colorado Springs areas, for example, placed only 8 or 9 percent of all of the persons who applied for matches in carpools. Many private firms have been reluctant to start rideshare programs. Uncertainty about insurance liability and whether or not rideshare services might become negotiable labor-management issues led many employers to resist any promotional programs. Furthermore, although the cost of starting and maintaining rideshare programs was fairly low, the recession of the early 1980s caused many firms to discontinue such efforts.

Although frequently lumped together in one category, rideshare arrangements have very different characteristics and are practical in widely varying settings. Vanpools consist of from 8 to 14 passengers in addition to a driver, who usually is a fellow worker. The driver is not paid for driving but benefits from free commutes and off-hour personal use of the van at reduced rates. In some programs, the driver also keeps additional fares after ridership reaches a break-even point. Fares are paid by monthly subscriptions and are based on the amortized costs of the van, direct operating expenses, and indirect expenses, such as insurance and administrative overhead. In company-run programs, some of the indirect costs usually are assumed by the employer. Vans may be owned by the company that employs the workers on a lease basis, or by one of the commuters, who serves as an independent operator. Although many rideshare agencies have tried to encourage van owners to use their vehicles for vanpools, most pools operate in company-owned or third party vans. The third party provider has been a necessity when a rideshare agency has tried to establish pools with passengers from different firms, because most companies, worried about liability, have refused to allow other firms' workers to ride in its vans.

The economics of vanpool operation are appealing. The ratio of fixed costs to operating costs is much higher for vans than for automobiles, so vanpools are not competitive for short trips. Because 8 to 14 riders share the costs, however, vanpools are viable for one-way commutes of about 8 miles (13 Km) or more. The longer the trip, the greater the savings to the riders. Some vanpools travel up to 75 miles (120 Km) each way, providing individual commuters a savings of roughly \$6,000 each year over what they would pay to drive alone and \$1,200 from the cost of participating in a three-person carpool. The critical geographical variable affecting the viability of vanpools is the presence of 10 or more people who live and work in the same general area and

who travel to the same job sites at the same times. This means that vanpools usually go to and from central business districts or large outlying employment centers. When the concentration of workers traveling the same routes is high enough, subscription buses, in which up to 45 riders share the costs, may be successful. About 80 privately-chartered commuter buses transport over 3,000 persons to and from downtown Chicago each day; many of these were established when dramatic increases in commuter rail fares in 1981 made that mode too costly.

In contrast to the highly structured character of vanpools, which require monthly suscription payments and often have formal rules about matters like smoking and what topics are appropriate for discussion, carpools are very informal. Except when rideshare agencies, employers, or mutual acquaintances bring prospective poolers to each other's attention, third parties are not required to form or maintain carpools. The highly flexible character of carpools has made it difficult to develop any comprehensive, consistent data bases to study them. Some program administrators have estimated that two or three carpools are created informally for every one that results directly from the efforts of the agency. Many informal pools are formed as a result of the promotional work of the agency, but administrators lack the evidence to claim these arrangements when the results of their programs are scrutinized.

The informal character of carpools makes them very ephemeral arrangements. They are formed easily, but they also may be disbanded quickly. Because the number of riders is small, interpersonal relations tend to be more social. In buses or vanpools, passengers can bury their noses in newspapers, but in carpools, there is a much greater expectation that participants should converse. The reluctance to get into a situation where one will have to talk with strangers leads many commuters to participate in carpools only if they already know the other members. Many rideshare agencies have found that merely providing commuters with a list of others with whom they might form a carpool is not enough. In a Los Angeles project, for example, only 39 percent of the applicants who had received a list of prospective partners actually tried to contact anyone. To overcome the reluctance of persons to form carpools with persons they do not know, many agencies and firms have provided brokerage services, including arrangement of conference phone calls and personal introductions. Such efforts result in higher rates of carpool formation, but they add to the costs of rideshare programs, thereby making them less attractive. Existing carpools also are subject to social tensions that can result in their abrupt termination. Determination of how much compensation persons who drive most or all of the time should receive from other riders can cause hard

feelings, as can conflicts related to detours for private errands, tardiness, smoking, and radio station selection.

A primary attraction of carpools is that they do not require large numbers of commuters who share the same travel patterns. Only two persons are needed to form a carpool, making them the only viable alternative to driving alone for persons who live or work in low density areas or who have unusual travel patterns. They also are attractive to transportation planners and managers because they offer a simple and inexpensive solution to the most significant urban transportation problem — reducing congestion during peak periods. If one-half of the commuters who drive alone would “double up”, average work trip occupancy rates would increase from less than 1.3 to almost 1.7 persons per vehicle. Such expectations may be too great, however. Many commuters are unable to share rides or will do so only as a last resort, because their schedules are too irregular or unpredictable, because they need their own car for business travel during the workday, because they value the privacy they have when driving alone, or because they simply are unsociable. No matter how often they hear about the benefits of ridesharing, they will continue to drive alone unless major changes in fuel or parking costs or other factors force them to reorder their priorities. Barring drastic increases in fuel costs or significant changes in other forms of the metropolitan transportation system, the potential market for ridesharing may have reached its upper limit, making it less viable as a major solution to urban transportation problems in the future.